



Alcohol Flushing for Removing DNAPLs from Clay and Sand Layered Aquifer Systems



Developer: University of Vermont
Contract Number: DE-AR21-96MC33083
Crosscutting Area: ESP



Problem:

One of the greatest impediments to any in situ remediation technique is subsurface soil heterogeneities and their effect on fluid flow, initial contaminant distribution, and site characterization. Layered systems and lenses are common in the soil subsurface.

Solution:

The capabilities of alcohol flushing for remediating layered soils contaminated with dense nonaqueous phase liquids (DNAPLs) will be evaluated. Alcohol flushing, also called cosolvent flushing, is a relatively new in situ remediation technology that shows promise for widespread application to organic solvent contaminated sites. A layered soil system will be simulated in bench-scale models (soil columns) and different alcohol flushing scenarios will be evaluated to determine the most effective removal approach for this type of system.

Benefits:

- Potential to remove the DNAPL source located deep within the saturated zone
- Potentially could decrease cleanup time and total cleanup cost at DNAPL sites
- Due to being able to reuse the alcohol, this method could prove to be highly cost effective

Technology:

A layered soil system will be simulated in bench-scale soil columns. Different alcohol flushing scenarios will be evaluated to determine the most effective removal approach for this type of system. The specific project tasks include:

- 1) Characterization of alcohol-DNAPL interaction;
- 2) Characterization of soils and layering;

- 3) Bench-scale studies to evaluate various alcohol concentrations on DNAPL removal;
- 4) Bench-scale column studies to evaluate the effect of flow rate and interrupted flow on DNAPL removal;
- 5) Evaluation of alcohol reuse;
- 6) Determination of process feasibility including economic and environmental concerns; and,
- 7) Recommendations for demonstration and evaluation.

Contacts:

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DOE's Federal Energy Technology Center supports the Environmental Management - Office of Science and Technology by contracting the research and development of new technologies for waste site characterization and cleanup. For information regarding this project, the DOE contact is:

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Base Contract
Start

Bench Scale Studies of
Flow Rates Start

Contract End

Gate 3



OST Reference Number: 0315
Federal Energy Technology Center

May 1999
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